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ABSTRACT

To examine the effects of an 8-week parent/child cognitive behavioral treatment intervention on physiological, symptomatic, and behavioral indices of asthma, a comparison was made of results on 1-year pre-intervention and 1-year post-intervention assessments. The first year of the study involved a retrospective collection of medical data for 18 children (9 treatment and 9 matched controls); identical measures were gathered after treatment for the second year follow-up. Subjects (14 male and 4 female) ranged from 5.5 to 12 years of age. Therapists were seven pediatric psychology trainees, all experienced in behavioral medicine. Treatment was standardized across therapists by procedural outlines for each session, standardized relaxation tapes, weekly therapists' meetings throughout the study, and feedback from the principal investigator. Major goals of the study were (1) to improve daily pulmonary functioning; (2) to improve the symptomatic features of asthmatic attacks; and (3) to assess compliance with medications, to decrease children's manipulative or maladaptive behaviors prior to and during an asthma episode, and to increase school attendance. Additional goals for children included assessment of locus of control, self-image, and coping ability. The parent/child training program was found to be effective in maximizing daily pulmonary functions, decreasing symptomatic features of asthma, and increasing children's and parents' behavioral compliance and positive personal perceptions of the controllability of asthma. (RH)

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PARENT TRAINING WITH
ASTHMATIC CHILDREN

BY

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There are numerous problems encountered when trying to investigate the efficacy of treatment strategies used with asthmatic children and their parents. First, there is no universally accepted definition of asthma. Although it is generally accepted that bronchial asthma involves intermittent, variable, and reversible airway obstruction (Chai, 1975) which is characterized by episodes of breathlessness caused by constriction of the smooth muscles of the bronchial tubes, edema of the cell wall of hypersecretion of mucus.

Asthmatic episodes may be triggered by a myriad of causes ranging from allergies, changes in weather, physical exertion, stress, anxiety, or even laughter. For instance, some asthmatics have episodes only during certain seasons of the year. Often, the particular triggering stimulation varies not only from patient to patient, but from episode to episode in the same patient (Hock, Rodgers, Reddi, & Kennard, 1978). These individual differences between and even within asthmatics require both a closely matched control group for seasonal changes from one year to the next, as well as the use of the subject as his or her own control to assess individual changes as a result of treatment intervention. The most common fault in research with asthmatics is the failure to realize asthma episodes are variable and intermittent; without sufficient baseline and follow-up periods, the efficacy of an intervention cannot be assessed.

In any well controlled study of asthma, it is necessary to assess multiple dependent measures to determine the effect of behavioral interventions. Alexander and Solanch (1981) suggest the purpose of behavioral intervention procedures with asthmatics may have one of three separate objectives. The

first objective has been to alter general pulmonary functions and/or asthma symptoms directly (i.e., episodes of coughing, wheezing, etc.). The second goal has been either: a) reduce negative or maladaptive emotions resulting from having asthma and/or b) reduce negative emotions which may elicit or exacerbate asthmatic episodes. Changes in general lung functions per se would not be considered as a primary goal in this respect. The third goal in the treatment of asthma has been the objective of altering maladaptive, manipulative, or disruptive behaviors which are asthma related. Target behaviors such as malingering, manipulation, or attention-seeking behaviors are reduced through behavioral techniques.

The present study involved a comparison of a one year preintervention and a one year postintervention follow-up to examine the effects of an eight week parent/child cognitive behavioral treatment intervention on physiological, symptomatic, and behavioral indices of asthma. The first year of the study involved a retrospective collection of medical data for 18 children (9 matched-control and 9 treatment). This included physiological measures, symptomatic and behavioral measures of asthma. These same measures were gathered again for the second year of follow-up after treatment. The 18 subjects in this study ranged from age 5½ to 12 years of age, and included 14 males and 4 females. Therapists included 7 pediatric psychology trainees, all experienced in behavioral medicine. Treatment was standardized across therapists by procedural outlines for each session, standardized relaxation tapes, weekly therapists meetings throughout the study, and feedback from the principal investigator.

The first goal of the study was to improve daily pulmonary functioning. This was assessed by twice daily readings of peak flow meter measurements. The peak flow meter measures were recorded beginning at week one through

week eight of the treatment phase. The spirometry measurements were taken the week prior to treatment and week four and eight of the treatment session as well as at a 6 week follow-up.

The second goal was to improve the symptomatic features of asthmatic attacks. This was assessed by the parent filling out an asthma episode form each time the child had an asthma attack during the eight week treatment period. The number of emergency room visits and hospitalizations during the eight week period was also recorded. The goal was to decrease the frequency of asthma attacks.

The third general area of assessment was personal/behavioral. The first goal was to assess compliance with medications. During baseline and post-treatment phases parents filled out the asthma problem checklist which included items to assess problems with medication compliance. Compliance was also assessed by blood tests for Theophyllin levels at week one, three, five and seven of the treatment period and at a six week follow-up. Children's manipulative and maladaptive behaviors were assessed prior to and after the eight week treatment period. Assessments were done through the asthma problem checklist (which included child behavior items) and items on the asthma episode form. The goal was to decrease the child's manipulative or maladaptive behaviors prior to and during an asthma episode. The third goal was to increase school attendance. This was assessed with a daily asthma diary in which the parent recorded school attendance beginning on week one through week eight of the treatment phase.

Parental knowledge of asthma was assessed through the asthma quiz given prior to and after the eight week treatment phase. Information items on the parent observation checklist were also given pre and post treatment.

The goal was to increase parental knowledge of asthma. Goals for children within the personal/behavioral area included assessment of internal locus of control given pre and post treatment, as well as the child's Self-Image/Coping Inventory. Both of these tests were used to assess increases in the child's feeling of control, increased positive self-image, and increased feelings of being able to cope with asthma. The final goal was to increase parents' perceptions of the controllability of asthma. This was assessed by the catastrophe and control items on the Parent Observation Checklist. This test was given both pre and post treatment.

TREATMENT

Each parent-child training session lasted approximately 45 minutes. Session one had eight specific goals. The first goal was to introduce the child and parent to the study and review the child's asthma history for the past year. The second goal was to go over the asthma education information with the child and parent. The child was given a diagram of the lungs to study, bring back, and explain what happens during an asthma episode for the second session. The clinician then reviewed the asthma information handout with the parents. Next the child was introduced to the idea of relaxation and was shown how to do diaphragmatic breathing. It was emphasized to the child that he would begin doing regular relaxation practices starting the second week and would be given relaxation tapes each week. The next goal was to review the child's medications as prescribed. The next step was to review the asthma diary. The child and parent were given a sample chart and each item was reviewed as to how to check it off. The child was then shown the peak flow meter and instructed in its use. It was stressed to the child that the peak flow meter readings would probably get better each week,

but, that it was something that would take some practice. Finally, the parents and child were shown an asthma episode form, stressing the importance of filling out the entire sheet so that we could identify precipitants to asthma episodes and specific ways of helping the child and parent deal with asthma attacks. Information was included on the asthma episode form as how to handle mild episodes and how to differentiate mild episodes from moderate and severe episodes - which would require emergency room care. Finally, the child was told that he would receive a special prize if he brought in all the asthma diary and asthma attack sheets that were filled out for the eight weeks.

The second session started out with the child discussing the lung diagram he was given the previous week and explaining the various ways in which an asthmatic episode affects his lungs. The parent and the child both reviewed the asthma handout and presented any questions. The clinician then reviewed with the parent and the child the causes of the child's asthma and how asthma and stress are associated. The child and parents were given a rationale for using the relaxation training tape. The child was told to listen to this tape twice daily. The parents were given a relaxation tape which was optional for them to listen to. This tape helped to reassure and teach the parents relaxation techniques. It also helped to reassure and teach the parents relaxation techniques. It also helped to model for the child that both children and parents can benefit from relaxation exercises. The asthma diary data for the previous week was reviewed. If the child had had any asthmatic episodes, the asthma episode form was also reviewed. The parent was given a handout on the grab bag reinforcement technique. This form briefly explained the rationale for providing incentives for children to be compliant with medications, school attendance, using the peak flow meter,

listening to relaxation tapes, and not having asthma episodes. Children were given points for each of these appropriate behaviors. The criteria for gaining a reward was based on the first week's baseline data from the asthma diary. A minimum of 5% increase in total points was used as the reward criteria for the following week.

Session three consisted of reviewing the asthma diary and asthma episode form. Both the parent and child discussed the relaxation tape, including their reactions to it when they used it. The child was asked to model relaxation breathing that he had been taught on the tape. The child was given a new relaxation tape. This tape began general desensitization to asthma episodes, i.e., slight tightening in the chest - relax - feels o.k. Quiet time was presented as a time of removal of the child from positive reinforcement to be used when the child began to experience asthmatic symptoms such as tightening of the chest or beginning to cough or wheeze. Finally, they were asked to think of a special activity with the parent that the child could earn if he received enough points in the asthma diary to earn a reward for the week. A new criteria was set for receiving a reward for the following week.

In the fourth session, the asthma diary and asthma episode forms were reviewed. The child modeled the relaxation breathing and discussed the tapes as well as his feelings just prior to an attack. The child was then given a third relaxation tape. This tape helped the child imagine having the symptoms of a minor attack using relaxation and feeling better. The clinician reviewed the steps of what to do when the child began to have difficulty breathing. These included stopping an activity, drinking a warm or hot liquid, lying down and doing the relaxation exercises. Parents

were told how to cue their child to follow these steps, but encouraged to allow the child to take responsibility for these behaviors. Safe activities were reviewed with the parents and child, based on the pulmonary physician's estimate of the child's lung functioning. Almost all children were encouraged to swim as a large muscle activity which generally does not cause asthmatics difficulty, although many of the children chose more strenuous activities (one child attended P.E. and ran the 440 meter race). Finally, the criteria for the peak flow meter and the total points on the asthma diary were set again slightly higher than the week before.

Session five through session eight reviewed the asthma diary and the asthma episode form, the relaxation exercises for the child and what the child was earning for completing the asthma diary with sufficient points. Children continued to identify thoughts or feelings that were associated with asthmatic episodes. Individualized tapes were given to their child based on previous thoughts or situations which elicited asthmatic episodes. An image of having an asthma attack and dealing with it at home and later a severe enough attack to require emergency room care were given - with relaxing and coping images. Almost perfect compliance was required for the earning of a reward by session five.

RESULTS

The data from the treatment group is broken down into three general categories: physiological; symptomatic; and personal-behavioral. The physiological data indicated significant improvement in peak flow meter readings from week one through week eight was 22.22 liters per minute. This change was significant at the .01 level. It is interesting to note that two of the children were weaned from Prednisone during the eight week treatment period and continued to show increases in pulmonary functioning during this time. When children are consistently reinforced for compliance with medication, exercise limits, and

diaphragmatic breathing and not reinforced for asthma attacks, it appear that children's pulmonary functions reach a level of maximum functioning over time. It is not felt, based on past research that lung functioning per se is improved by this program. But, that maximum lung functioning for each child can be obtained and maintained through a parent training program which emphasizes adherence to healthy lifestyles.

Pre and post pulmonary functioning using spirometry measures did not show a significant improvement. Asthma is an extremely variable illness which typically displays wide variations in lung functioning from day to day. Therefore, a single pre and post measurement is less sensitive to these variations over time. It is important to obtain daily measures to adequately assess systematic improvements over time.

Symptomatic Variables

The second goal was to decrease the frequency, duration, and severity of asthma attacks. Frequency of asthma episodes were reduced. The group averaged 2.1 asthma episodes during the first two weeks of the treatment phase. By the last two weeks of the treatment period, subjects averaged .2 episodes.

Both the duration and severity of asthma episodes decreased over the eight week training period. Interestingly, the parents and children became more attuned to the child's breathing. Initially, asthma episode forms were filled out only for pronounced episodes, lasting from 30 minutes to 2 hours. By the end of the eight week training session, parents were filling out the asthma episode forms for extremely mild symptoms of coughing or wheezing lasting for less than 15 minutes.

There was only one subject that required emergency room treatment for a single episode in which he cleared and was sent home. The trigger for this episode was an extremely high dust and pollen count during an Oklahoma wind

storm. There were no hospitalizations during the eight week treatment of six week follow-up period. The data for the year previous to the treatment intervention indicated the group averaged 25 visits per year. Based on this average, 9.5 visits would be the expected number of visits during the eight week treatment and six week follow-up period.

When comparing the treatment group to the matched control group for the one year follow-up, there was a significant decrease at the .05 level in both ER and number of hospitalizations for the treatment group.

Personal/Behavioral

Compliance with medications was measured by the asthma problem checklist items for compliance. The pre and post responses showed a significant and positive increase in parents' endorsement of improvement in children's behavioral compliance with medications. By week five all children showed a 100% compliance with medication which maintained for eight of nine children throughout the treatment phase. The one child failed to take one dose of medication once in the last three weeks of the study. Overall, the goal of increasing medication compliance was achieved.

Decreases in manipulative/maladaptive behaviors such as initiation or exacerbation of asthma attacks was also assessed. By week five none of the asthma episodes were associated with emotional factors. It should be remembered that in week three a form of "time out" was introduced for all asthmatic episodes. Therefore, potential reinforcement for asthma episodes dramatically decreased. One aspect of the parent/child training was the desire to have children assess their physical limitations and to learn signs of impending asthma episodes prior to an acute attack. Many of these children have been extremely overprotected by the parents and therefore have not learned to self-limit physical activity. By session

three we began to have children test out their own physical limits. By week five all asthmatic episodes were due to overexertion/fatigue, allergies, or sudden weather changes.

While the daily recording of asthma episode behaviors showed a decrease in manipulative behaviors, the asthma problem checklists for manipulative child behaviors did not show a significant decrease between the pre and post measures, at the .05 level.

School attendance was measured by daily recordings on the asthma diary. By week four, eight of the nine subjects had obtained a 100% school attendance, although average school attendance on week one was four out of five days. Parental reports for the previous year indicated a significantly lower average weekly attendance. It is felt that when parents are given a concrete basis on which to judge severity of attacks, children are reinforced for school attendance and are placed in time-out for attacks, it is not surprising to see an almost immediate positive change in school attendance.

Educational information concerning asthma was assessed by pre and post test of the asthma information quiz and the information items on the parent asthma questionnaire. At the .05 level, both measures indicated a significant increase in parents' information concerning the cause and treatment of asthma.

The child's internal locus of control was assessed by the use of pre and post treatment of the Child's Health Locus of Control (Parcel, 1978). The three factors within this test are internal, powerful others, and chance. There is a positive and significant increase in the number of items endorsed in the direction of the internal factor. There was a significant decrease in the number of items endorsed on the powerful others factor. Additionally, the child's self-image as measured by the Coping/Self-Image Questionnaire showed a significant and positive increase. Yet, the Coping items did not show a similar significant increase.

The final measure was a pre and post assessment of the parent's perceptions of the controlability of asthma. This was assessed by the parent observation checklist items examining the factors of catastrophe and control. There is a significant decrease in item endorsement for the factors of catastrophe and significant increase in the parent perceptions of control.

In summary, the parent/child training program has been found to be effective in maximizing daily pulmonary functions, decreasing symptomatic features of asthma and increasing children and parents' behavioral compliance and positive personal perceptions of the controlability of asthma.

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